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TITLE: Family of mammalian potassium channels, their cloning and their use especially for the screening of drugs

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US-CL-CURRENT: 435/69.1; 435/320.1, 435/325, 536/23.1

CLAIMS:

We claim:

1. An isolated and purified nucleic acid molecule encoding a mammalian protein which comprises 2 P domains and 4 transmembrane segments, and is competent to transport potassium across a membrane.
2. An isolated and purified nucleic acid molecule encoding a human protein which comprises 2 P domains and 4 transmembrane segments, and is competent to transport potassium across a membrane.
3. The nucleic acid molecule of claim 2 encoding a human protein which exhibits weak inward rectification.
4. The nucleic acid molecule of claim 3 which is expressed in brain and heart tissue and in addition, in at least one of the following tissues: placenta, liver, skeletal, muscle, kidney and pancreas.
5. The human nucleic acid sequence of claim 2 which comprises the sequence represented by SEQ ID No. 1.
6. A self replication vector comprising the nucleic acid molecule of claim 2.
7. A cell transformed with the self replicating vector of claim 6, which cell expresses a human protein which comprises 2 P domains and 4 transmembrane segments, and is competent to transport potassium across a membrane.
8. A micro-injected cell comprising the RNA transcript synthesized from the nucleic acid molecule of claim 2, which cell expresses a human protein which comprises 2 P domains and 4 transmembrane segments, and is competent to transport

potassium across a membrane.

9. The transformed cell of claim 7, which cell is selected from the group consisting of prokaryotes and eukaryotes.
10. The transformed cell of claim 9 which is a bacterium.
11. The transformed cell of claim 10 which is a yeast, insect, plant or mammalian cell.
12. A method for the production of a human protein competent to transport potassium across a membrane which comprises 2 P domains and 4 transmembrane segments, comprising transferring the vector of claim 6 into a cellular host, culturing the cellular host under conditions allowing the production of said potassium channel, and purifying the human potassium channel.
13. The method of claim 12 wherein the cellular host is selected from the group consisting of prokaryotes and eukaryotes.
14. A pharmaceutical composition for the compensation of a deficiency in potassium channels at the level of one or more tissues, which comprises an isolated and purified nucleic acid molecule encoding a human protein comprising 2 P domains and 4 transmembrane segments which protein is competent to transport potassium across a membrane.
15. A pharmaceutical composition which comprises human cells transformed with the nucleic acid molecule of claim 2.